WHAT IS CLAIMED IS:

1. An ejector comprising:

a nozzle having an inner wall surface for defining a fluid passage through which a drive fluid flows, the nozzle including a throat section having a cross-sectional area that is the smallest in the fluid passage;

a pressurizing section in which a fluid is sucked by entrainment of a jet flow of the drive fluid jetted from the nozzle and is mixed with the drive fluid jetted from the nozzle; and

a needle valve for changing a throttle opening degree of the fluid passage, the needle valve being disposed to be displaced in an axial direction in the fluid passage of the nozzle, wherein:

the needle valve has an end section formed in a tapered shape so that a cross-sectional area of the needle valve decreases toward a top end of the needle valve;

the end section of the needle valve reaches to a downstream side of the throat section in a flow direction of the drive fluid at least when the throttle opening degree is minimum; and

the fluid passage of the nozzle has a substantially constant cross-sectional area, in a downstream section downstream from the throat section.

2. An ejector comprising:

a nozzle having an inner wall surface for defining a

fluid passage through which a drive fluid flows, the nozzle including a throat section having a cross-sectional area that is the smallest in the fluid passage;

a pressurizing section in which a fluid is sucked by entrainment of a jet flow of the drive fluid jetted from the nozzle and is mixed with the drive fluid jetted from the nozzle; and

a needle valve for changing a throttle opening degree of the fluid passage, the needle valve being disposed to be displaced in an axial direction in the fluid passage of the nozzle, wherein:

the needle valve has an end section formed in a tapered shape so that a cross-sectional area of the needle valve decreases toward a top end of the needle valve;

the end section of the needle valve reaches to a downstream side of the throat section in a flow direction of the drive fluid at least when the throttle opening degree is minimum; and

the fluid passage is formed into a tapered shape having a cross-sectional area that is gradually decreased by a taper angle $\Theta 1$ toward an outlet of the fluid from a downstream side of the throttle section to at least the throat section, and the taper angle $\Theta 1$ of the fluid passage is smaller than a taper angle $\Theta 2$ of the end section of the needle valve.

3. An ejector according to claim 2, wherein, the fluid passage is formed in a multi-step tapered shape tapered in

multiple steps.

4. An ejector according to claim 2, wherein the throat section has an inner periphery surface formed in a curved shape.

5. An ejector according to claim 1, wherein the top end of the needle valve reaches to the downstream side of the fluid flow with respect to the throat section even when the throttle opening degree is maximum.

6. An ejector according to claim 1, wherein the end section of the needle valve is formed into a conical tapered shape.

7. An ejector according to claim 1, wherein the end section of the needle valve is formed in a hanging bell shape.

8. An ejector cycle comprising:

a compressor for compressing refrigerant;

a high-pressure side heat exchanger for cooling refrigerant discharged from the compressor;

an evaporator for evaporating low-pressure refrigerant after being decompressed;

an ejector including

a nozzle having an inner wall surface for defining a refrigerant passage for decompressing refrigerant from the high-pressure side heat exchanger, the nozzle

including a throat section having a cross-sectional area that is the smallest in the refrigerant passage,

a pressurizing section in which refrigerant from the evaporator is sucked by entrainment of a jet flow of the refrigerant jetted from the nozzle and is mixed with the refrigerant jetted from the nozzle, and

a needle valve for changing a throttle opening degree of the refrigerant passage in the nozzle, the needle valve being disposed to be displaced in an axial direction in the refrigerant passage of the nozzle; and

a gas-liquid separator for separating refrigerant flowing from the ejector into a gas refrigerant to be supplied to the compressor and a liquid refrigerant to be supplied to the evaporator, wherein:

the needle valve has an end section formed in a tapered shape so that a cross-sectional area of the needle valve decreases toward a top end of the needle valve;

the end section of the needle valve reaches to a downstream side of the throat section in a flow direction of the refrigerant at least when the throttle opening degree is minimum; and

the refrigerant passage of the nozzle has a substantially constant cross-sectional area, in a downstream section downstream from the throat section.

9. An ejector cycle according to claim 8, wherein a refrigerant pressure in the high-pressure side heat exchanger

becomes higher than the critical pressure of the refrigerant in an operation mode.

10. An ejector cycle according to claim 8, wherein carbon dioxide is used as the refrigerant.

11. An ejector cycle according to claim 8, wherein the refrigerant passage is formed into a tapered shape having a cross-sectional area that is gradually decreased by a taper angle $\Theta 1$ toward downstream from a downstream side of the throttle section to the throat section, and the taper angle $\Theta 1$ of the refrigerant passage is smaller than a taper angle $\Theta 2$ of the end section of the needle valve.